CLAIMS

What is claimed is:

1. A method of channel data rate adaptation in a wireless communication network, the method comprising:

setting a data rate for a communication channel to be used for transmitting data to a remote receiver at a variable transmit power that is controlled upward and downward by the remote receiver as needed to achieve a desired received data quality at the remote receiver;

monitoring transmit power information for the communication channel as an indication of current radio conditions at the remote receiver; and

changing the data rate for the communication channel based on the transmit power information.

2. The method of claim 1, wherein setting a data rate for a communication channel to be used for transmitting data to a remote receiver at a variable transmit power comprises setting the data rate of a communication channel assigned to the remote receiver to a desired data rate.

3. The method of claim 1, wherein monitoring transmit power information for the communication channel as an indication of current radio conditions at the remote receiver comprises generating one or more filtered values of the transmit power and comparing the one or more filtered values against defined upper and lower power limits.

4. The method of claim 3, wherein changing the data rate for the communication channel based on the transmit power information comprises initiating a downward rate change if one of the one or more filtered values approaches the upper power limit, and initiating an upward rate change if one of the one or more filtered values approaches the lower power limit.

5. The method of claim 3, further comprising generating a first filtered value for use in determining whether to initiate a downward rate change and generating a second filtered value for use in determining whether to initiate an upward rate change, and further comprising using a longer filter time constant to generate the second filtered value as compared to the first filtered value.

6. The method of claim 1, wherein monitoring transmit power information for the communication channel as an indication of current radio conditions at the remote receiver comprises generating one or more filtered values of the transmit power and comparing the one or more filtered values against a first threshold for determining whether to initiate a rate decrease, and against a second threshold for determining whether to initiate a rate increase.

7. The method of claim 6, wherein the second threshold comprises a threshold set relative to an upper power bound associated with a higher data rate, such that a change to that higher data rate is not initiated unless the comparison indicates that a desired power margin would exist if the data rate is increased to the higher data rate.

8. The method of claim 1, wherein monitoring transmit power information for the communication channel as an indication of current radio conditions at the remote receiver comprises comparing an average transmit power used for transmission of data on the communication channel to upper and lower power limits set for the channel, wherein a high average power indicates relatively poor current radio conditions at the remote terminal and wherein a low average power indicates relatively good current radio conditions at the remote terminal.

9. The method of claim 1 further comprising updating the transmit power information according to a defined transmission frame timing associated with the communication channel.

10. The method of claim 8, wherein updating the transmit power information according to a defined transmission frame timing associated with the communication channel comprises updating the transmit power information on at least a per frame basis.

11. The method of claim 1, wherein monitoring transmit power information for the communication channel as an indication of current radio conditions at the remote receiver comprises monitoring power control commands sent from the remote receiver that are associated with controlling the transmit power of the communication channel.

12. The method of claim 10, further comprising generating one or more filtered values of the power control commands and determining whether the one or more filtered values indicate predominantly up commands or indicate predominantly down commands.

13. The method of claim 11, wherein changing the data rate for the communication channel based on the transmit power information comprises initiating a downward rate change if the one or more filtered values indicate predominantly up commands.

14. The method of claim 11, wherein changing the data rate for the communication channel based on the transmit power information comprises initiating an upward rate change if the one or more filtered values indicate predominantly down commands.

15. The method of claim 11, wherein generating one or more filtered values of the power control commands and determining whether the one or more filtered values indicate predominantly up commands or predominantly down commands comprises generating a first filtered value according to a first filter time constant and generating a second filtered value according to a second filter time constant, and basing the determination of downward rate changes on the first filtered value and basing the determination of upward rate changes on the second filtered value.

16. The method of claim 1, wherein the network comprises a cdma2000 network and the communication channel comprises a forward link supplemental channel (F-SCH) at a radio base station in the network to be used for serving a particular mobile station, and wherein changing the data rate for the communication channel based on the transmit power information comprises sending a rate change request for the forward link supplemental channel from the radio base station to an associated base station controller.

17. The method of claim 16, further comprising sending an extended supplemental channel assignment message from the base station controller for transmission to the remote receiver to inform the remote receiver of a change in a current data rate assignment of the forward link supplemental channel.

18. The method of claim 1, wherein monitoring transmit power information for the communication channel as an indication of current radio conditions at the remote receiver comprises maintaining one or more filtered values indicative of transmit power for the communication channel.

19. The method of claim 18, wherein changing the data rate for the communication channel based on the transmit power information comprises comparing one or more filtered values to one or more rate change threshold values to determine whether a rate change is warranted.

20. The method of claim 19, further comprising resetting at least one of the one or more filtered values responsive to initiating a rate increase or a rate decrease.

21. The method of claim 20, further comprising, after initiating a rate increase based on a filtered value, resetting the filtered value to be greater than it was before the rate increase was initiated.

22. The method of claim 20, further comprising, after initiating a rate decrease based on a filtered value, resetting the filtered value to be less than it was before the rate decrease was initiated.

23. A radio base station for use in a wireless communication network, the method comprising:

transmitter circuits to transmit radio signals on one or more forward link communication channels to mobile stations; and

a forward link processing circuit to control the transmitter circuits;

said forward link processing circuit configured to set a data rate for a communication channel to be used for transmitting data to a mobile station at a variable transmit power that is controlled upward and downward by the mobile station as needed to achieve a desired received data quality at the mobile station; and

said forward link processing circuit comprising a rate adaptor circuit configured to:

monitor transmit power information for the communication channel as an indication of current radio conditions at the mobile station; and

change the data rate for the communication channel based on the transmit power information.

24. The radio base station of claim 23, wherein the radio base station is configured to set the data rate for the communication channel to a desired value and the rate adaptor circuit is configured to adapt the data rate as needed based on monitoring the transmit power information.

25. The radio base station of claim 23, wherein the rate adaptor circuit comprises one or more filter circuits to generate one or more filtered values related to transmit power for the communication channel as the transmit power information, and wherein the rate adaptor circuit is configured to monitor the transmit power information for the

communication channel by comparing the one or more filtered values against one or more rate change thresholds.

26. The radio base station of claim 25, wherein the rate adaptor circuit is configured to reset at least one of the one or more filtered values responsive to initiating a rate increase or a rate decrease.

27. The radio base station of claim 26, wherein, after initiating a rate increase based on a filtered value, the rate adaptor circuit is configured to reset the filtered value to be greater than it was before the rate increase was initiated.

28. The radio base station of claim 26, wherein, after initiating a rate decrease based on a filtered value, the rate adaptor circuit is configured to reset the filtered value to be less than it was before the rate decrease was initiated.

29. The radio base station of claim 25, wherein the rate adaptor circuit is configured to change the data rate for the communication channel based on the transmit power information by initiating a downward rate change if one of the one or more filtered values approaches a rate decrease threshold, and initiating an upward rate change if one of the one or more filtered values approaches a rate increase threshold.

30. The radio base station of claim 25, wherein the rate adaptor circuit is configured to generate a first filtered value according to a first filter time constant for use in determining whether to initiate a downward rate change and generate a second filtered value according to a second, longer filter time constant for use in determining whether to initiate an upward rate change.

31. The radio base station of claim 23, wherein the rate adaptor circuit comprises one or more filter circuits to generate one or more filtered values of transmit power for the communication channel, and wherein the rate adaptor circuit is configured to monitor the transmit power information for the communication channel by comparing the one or more filtered values against a rate increase threshold and a rate decrease threshold.

32. The radio base station of claim 31, wherein the rate adaptor circuit is configured to set the rate increase threshold based on a power requirement associated with a higher data rate, and is further configured to initiate a change to the higher data rate if the comparison indicates that a sufficient power margin would be maintained for the communication channel at the higher data rate.

33. The radio base station of claim 23, wherein the rate adaptor circuit is configured to monitor the transmit power information for the communication channel by comparing an average transmit power used for transmission of data on the communication channel to upper and lower power limits set for the channel.

34. The radio base station of claim 23, wherein the rate adaptor circuit is configured to update the transmit power information according to a defined transmission frame timing associated with the communication channel.

35. The radio base station of claim 34, wherein the rate adaptor circuit updates the transmit power information on at least a per frame basis.

36. The radio base station of claim 23, wherein the rate adaptor circuit is configured to monitor transmit power information for the communication channel by monitoring

power control commands sent from the mobile station that are associated with controlling the transmit power of the communication channel.

37. The radio base station of claim 36, wherein the rate adaptor circuit is configured to determine whether a greater percentage of the power control commands are up commands or are down commands.

38. The radio base station of claim 37, wherein the rate adaptor circuit is configured to initiate a downward rate change if the greater percentage of the power control commands are up commands, and to initiate an upward rate change if the greater percentage of the power control commands are down commands.

39. The radio base station of claim 36, wherein the rate adaptor circuit is configured to filter the power control commands according to a first filter time constant to determine whether to initiate a downward rate change, and is configured to filter the power control commands according to a second, longer filter time constant to determine whether to initiate an upward rate change.

40. The radio base station of claim 36, wherein the rate adaptor circuit is configured to initiate a downward rate change if the power control commands predominantly are up commands, and to initiate an upward rate change if the power control commands predominantly are down commands.

41. The radio base station of claim 23, wherein the radio base station comprises an IS-2000 radio base station for use in a cdma2000 wireless communication network, and the communication channel comprises a forward link supplemental channel (F-SCH) to

be used for serving a particular mobile station, and wherein the radio base station is configured to change the data rate by sending a rate change request for the forward link supplemental channel to an associated base station controller.

42. The radio base station of claim 41, wherein the base station controller is configured to send an extended supplemental channel assignment message for transmission to the mobile station to inform the mobile station of a changed data rate assignment for the forward link supplemental channel.